

MARITIME SAFETY COMMITTEE
90th session
Agenda item 10

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SAFETY OF NAVIGATION

Operating anomalies identified within ECDIS

Submitted by the International Hydrographic Organization (IHO)

SUMMARY

<i>Executive summary:</i>	This document reports on the actions taken by the IHO since MSC 89 with respect to the "Operating anomalies identified within ECDIS"
<i>Strategic direction:</i>	5.2
<i>High-level action:</i>	5.2.4
<i>Planned output:</i>	No related provisions
<i>Action to be taken:</i>	Paragraph 16
<i>Related documents:</i>	SOLAS chapter V; SN.1/Circ.266/Rev.1; MSC.1/Circ.1221, MSC.1/Circ.1389, MSC.1/Circ.1391; MSC 88/25/6, MSC 88/26, paragraphs 25.19 to 25.22; MSC 89/24/2, MSC 89/24/3, MSC 89/25, paragraphs 24.6 to 24.9; and NAV 57/15, paragraphs 14.38 to 14.48

Introduction

1 In document MSC 89/24/2 the IHO reported on the outcome of a workshop organized by the IHO to discuss "Operating anomalies identified within ECDIS" as raised by Japan, Norway, the United Kingdom, the International Chamber of Shipping (ICS) and the International Federation of Shipmasters' Association (IFSMA) in document MSC 88/25/6. Australia, Canada, Chile, Japan, Norway, the United Kingdom, ICS and IFSMA submitted document MSC 89/24/3 supplementing the report from IHO and proposing additional steps that ought to be taken. MSC 89, after considering these documents, referred the matter to the fifty-seventh session of the NAV Sub-Committee under their agenda item on "Any Other Business and invited NAV to advise MSC 90 on the way forward. The matter was also referred to the COMSAR and STW Sub-Committees for careful consideration on an urgent basis.

IHO Standards

2 As reported in MSC 89/24/2 the IHO initiated a review of the relevant IHO Standards to identify and remove any possible ambiguities in the interpretation of the Standards. This work is underway with some revisions already with IHO Member States for adoption.

These revisions do not introduce any new substantive changes to the standards but seek to ensure that the existing standards are clear and unambiguous and so can be interpreted by manufacturers in a consistent manner. This work will continue.

Meeting of interested parties hosted by the United Kingdom

3 In September 2011, the United Kingdom (UKMCA and UKHO) convened a meeting of interested parties in London. The meeting reviewed various issues where different ECDIS equipment had been identified as not performing as anticipated by the relevant standards. Eighteen anomalies, in other words, unanticipated behaviours, were identified. The anomalies range in their importance but include the possibility of significant charted features, for example, wrecks not displaying appropriately on some manufacturer's models of ECDIS. This has obvious implications for safety of navigation. The meeting participants identified various actions that mariners could take in order to mitigate against the anomalies that have been identified, should they be present in any particular manufacturer's equipment. These actions are described in the documentation that accompanies the IHO check data. Unfortunately, there are cases that have been identified where the only mitigating action to overcome certain anomalies, such as wrecks not displaying at all, is to refer to paper charts for additional information.

4 The meeting also reviewed the "ECDIS and ENC Data Presentation and Performance Check for Ships" then being prepared by the IHO. This intention to issue such a check dataset was outlined in a verbal statement to NAV 57.

IHO ENC/ECDIS Data Presentation and Performance check

5 The IHO ECDIS and ENC Data Presentation and Performance Check for Ships has been developed for a wide circulation to mariners using ECDIS and is designed to identify whether ECDIS being used in ships is based on the latest IHO Standards and can display and react to chart information as intended by the IHO. The checks include the more serious anomalies that have been identified. The check data was distributed in October 2011 through the normal ENC provider network and also made available for free download from the IHO website. The checks cover:

- the display of navigation areas recently recognized by IMO (ESSA (Especially Sensitive Sea Area), PSSA (Particularly Sensitive Sea Area), ASL (Archipelagic Sea Lanes);
- the display of lights with complex characteristics;
- the display of underwater features and isolated dangers; and
- detection of objects by "route checking" in voyage planning mode.

Feedback from mariners using this check data continues to be received at the IHO headquarters. Updated information can be provided verbally to the Committee at its ninetieth session.

6 By the end of January 2012, the IHO had received results of the checks on ECDIS from almost 400 seagoing respondents. There are a number of possible reasons for the limited response rate. Not all mariners may have received the data, others may not have reported their findings if the checks were successful, some may have been unable to respond easily due to the lack of internet-based communications aboard.

7 The IHO ECDIS and ENC Data Check has revealed a number of shortcomings in some manufacturers' systems being used at sea, particularly in older systems. The results received by the IHO so far cover 15 of the approximately 25 (as known by the IHO) manufacturers of type-approved ECDIS. Whilst the number of responses received so far is relatively low in comparison with the total ECDIS fit throughout the world fleet, there are nevertheless some common issues in the results that merit further consideration.

8 A significant number of ships reported that they were unable to clearly identify the recently IMO-adopted ASL, PSSA or ESSA on the ECDIS display. Some ships reported that lights with complex characteristics such as multiple coloured sectors were not displayed as intended by the IHO. The display of underwater features and isolated dangers was reported as variable across the different manufacturers' ECDIS models, however, in most cases the display gave a safe, if not entirely correct, interpretation of the ENC data. A high proportion of ships reported that navigationally significant objects, most importantly, some land features, but also "areas to be avoided" and a marine aquaculture installation, did not raise an appropriate warning in the route checking mode of ECDIS. Operating the ECDIS display in "full" rather than "standard" display mode, will overcome a number of the anomalies – but at the risk of creating a more cluttered display. Few ships in the nearly 400 reports received by the IHO appear to have an ECDIS that successfully passed all parts of the IHO checks.

9 With regard to anomalies for which the only mitigating action is to refer to paper charts, such as the inability to display certain wrecks and underwater obstructions in any mode of operation, these anomalies appear to apply to one manufacturer only. The IHO has made that manufacturer aware of the situation and has requested information be provided urgently on what remedial action is being taken and how affected vessels are being contacted to alert them to this shortcoming.

10 The checks that have produced negative results vary both between manufacturers and also between different software versions from the same manufacturer. No check reveals the same failure across all the ECDIS models produced by the 15 manufacturers' systems reported to the IHO. This appears to confirm that certain parts of the requirements of the ECDIS standards have been interpreted and implemented in different ways by different manufacturers. Several IHO Working Groups are already reviewing the relevant standards to make them as clear as possible. The results also indicate that as problems become known, continuing improvements have been made to individual manufacturer's software over time. However, the results also indicate that even when a manufacturer has updated or improved its software, this does not appear to be widely implemented in ECDIS equipment already in use at sea through an appropriate upgrading or software maintenance regime as described in SN.1/Circ.266/Rev.1 (Maintenance of Electronic Chart Display and Information System (ECDIS) Software).

Meeting of interested parties hosted by IHO

11 The IHO hosted a technical workshop at the International Hydrographic Bureau in Monaco from 25-26 January 2012. The workshop format and participation was similar to the workshop held in February 2011. It was attended by 30 leading representatives drawn from stakeholder groups including IHO and IMO Member States; intergovernmental organizations, non-governmental international organizations, data service providers, and ECDIS manufacturers. The purpose of the workshop was to review the feedback received so far from the IHO ECDIS and ENC Data Check and to develop advice and possible action for further consideration by stakeholders including IMO.

12 The participants of the workshop supported IHO action to:

- seek further distribution of the Presentation and Performance Check for Ships, such as advertising its existence in Notices to Mariners;
- continue analysis of the results of the checks and provide a verbal update at MSC 90;
- continue dialogue with each ECDIS manufacturer to clarify reported discrepancies and to ascertain what remedial action has been taken or is intended by those manufacturers; and
- continue the review of its standards to further resolve ambiguities that might lead ENC producers, ECDIS manufacturers or equipment certification authorities to inappropriately implement the intentions of the standards.

13 Significantly, the participants at the workshop were of the opinion that irrespective of the substantial efforts now being made by the IHO, ECDIS manufacturers and equipment type-testing authorities to ensure that ECDIS meets the latest standards and requirements adopted by IMO, there is no specific regulatory requirement for ship operators to update ECDIS systems that are already at sea and being operated under an old but valid type approval certification. Equally, there is no easy way for ship operators to know when a manufacturer has released a new version of their ECDIS software that resolves identified software issues. The situation is aggravated by the fact that under current arrangements ECDIS manufacturers often have difficulty in maintaining contact with ships in which their equipment is fitted. This means that ECDIS equipment that will not pass the recent IHO checks based on the latest IMO requirements, especially those relating to the safety of navigation, can still be used at sea.

14 The participants at the workshop considered that the widest possible distribution and use of the check data would greatly assist in raising the level of mariner awareness that an ECDIS, like any other software based system, may be prone to "bugs" and shortcomings that are not related to the ENC data and may require the use of operator "work-around" solutions until such time as a newer version of the software can be installed.

15 Finally, the workshop participants reasoned that further consideration of the matters related to "operational anomalies related to ECDIS" were best addressed and coordinated through IMO as these had particular implications for safety of navigation and therefore came within the remit of the Sub-Committee on the Safety of Navigation to consider further.

Action requested of the Committee

16 The Committee is invited to:

- .1 note the summary review of the replies received from the IHO ECDIS and ENC Data Presentation and Performance Check for Ships;
- .2 note the outcome of the ECDIS stakeholders' workshop hosted by the IHO; and
- .3 take any further action it considers appropriate.